COMMONWEALTH OF PENNSYLVANIA.

DEPARTMENT OF AGRICULTURE.

BULLETIN No. 64.

Nature Study Reference Library

FOR USE IN PUBLIC SCHOOLS.

ARRANGED BY MIRA LLOYD DOCK,

From Lists Furnished the Secretary of Agriculture by Forty-Eight Natural History Teachers.

PUBLISHED BY DIRECTION OF THE SECRETARY.

1900.

WM. STANLEY RAY,
STATE PRINTER OF PENNSYLVANIA.
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PREFACE.

HARRISBURG, PA., *June 30, 1900.*

The library list herewith presented is the result of the best judgment and scholarship of the leading educators in Natural Science in the United States and Canada. Blank forms of report were sent to about one hundred scientific teachers in the colleges and higher technical schools of the country, together with a letter requesting them to name a list of books suitable for a Natural History Library in a country school. The names of those who responded are given, and the books which they recommend are arranged in three grades suitable for scholars of ages six to nine years, nine to twelve and twelve to eighteen. A supplemental list is given for each of these grades, so that schools wishing to add to their libraries can have access to lists of suitable books.

The work of the compilation of these lists was performed by Miss Mira L. Dock, of Harrisburg, Pa., who is well known as a competent and discriminating student of Natural History. With the exception of a very few, all of the books have been examined by Miss Dock, who has spent several months in this work, visiting the best libraries and teachers in various parts of the country, consulting with students, librarians and experienced instructors, in order to get full information as to the merits and adaptability of the several books recommended.

The list, therefore, has been selected with unusual care, and will, it is hoped, be of great service in aiding country school boards to select libraries suited to the needs of the scholars whom they are endeavoring to educate.

A list is also appended for the use of teachers. Whilst all of the books in the several grades should be read by teachers who wish to be thoroughly informed, yet the supplemental list recommended for them, is specially valuable as giving a larger view of the subjects which they expect to teach.

The indications now are that Nature Study will soon be required in the public schools. When this comes, a suitable library will be a necessity in order to make the work effective and to maintain interest on the part of the older pupils in their search for information. School directors in Pennsylvania have, under the law, authority to levy a tax for the support of a public library in their district, and it also would seem permissible for them to take some of the annual State appropriation for school books and use it for the purchase of a library for reference, such as is here presented. No better investment could be made in any community than in the establishment of libraries for free public use, and their influence for good will soon be seen in the advanced intelligence and refinement of the citizens.

The list found in this Bulletin is presented in the hope that it may induce school boards to try the experiment of placing suitable literature in the hands of the country children and thus multiply the teaching force that is at work moulding the character and thought of the scholars and preparing them for greater appreciation of life and its work. As has been stated, the list is most carefully selected and arranged and will be worth to any school several times its cost.

JOHN HAMILTON,
Secretary of Agriculture.

LIST OF PERSONS RECOMMENDING BOOKS, TOGETHER WITH THEIR TITLES AND P. O. ADDRESSES.

Name.	Title.	Address.
BEAL, W. J. ScM., Ph. D.,	Prof. of Botany and Forestry,	Agricultural College, Mich.
BEARDSHEAR, W. M., ..	Pres. of Iowa State Col., A. & M. Arts,	Ames, Iowa.
BESSEY, CHAS. E., ...	Prof. of Botany, ...	Univ. of Neb., Lincoln, Neb.
BISHOP, W. H., ...	Prof. of Agri. and Biology,	Newark, Del.
BLAKELY, E. A., ...	Chief Clerk, Provincial Secretary's Office, Dept. of Edu.,	Winnipeg, Manitoba.
BRIGHAM, A. A., Ph. D.,	Prof. of Agri., ...	R. I. Col., A. & M. Arts, Kingston, R. I.
BRITTON, W. E., B. S., .	Horticulturist, ...	Conn. Agri. Exp. Sta. New Haven, Conn.
BUCKHOUT, W. A., ...	Prof. of Botany and Horticulture,	State College, Centre Co., Pa.
CARD, F. W., ...	Prof. of Horticulture, ...	R. I. Col. A. & M. Arts. Kingston, R. I.
COULTER, STANLEY, ..	Prof. of Biology, ...	Purdue Univ. Lafayette, Ind.
CURTISS, C. F., M. S., .	Prof. of Agri., ...	College of Agri. and Mech. Arts., Ames, Iowa.
EARLE, T. S., ...	Biologist, Ala. Exp. Sta.,...	Auburn, Ala.
FIELD, DR. G. W., ...	Biologist, ...	R. I. Col. of A. and M. Arts, Kingston, R. I.
GOGGIN, D. J., ...	Supt. of Edu. in the N. W. Territories.	Regina. N. W. T., Canada.
GOODRICH, C. L., ...	Direct. of Agri. Dept.. ...	Hampton N. & A. Institute, Hampton, Va.
HALL, F., ...	Editor and Librarian, ...	N. Y. Agri. Exp. Sta., Geneva, N. Y.
HENRY, DR. W. A., ...	Director of Agri. Exp. Sta.,	Univ. of Wis., Madison, Wis.
HERRICK, GLENN W.,..	Prof. of Botany and Entomology.	Agri. College, Miss.
HILLS, J. L., ...	Director Vt. Agri. Exp. Sta.,	Burlington, Vt.

List of Persons Recommending Books—*Continued.*

Name.	Title.	Address.
HYAMS, C. W., ...	Assist. Botanist and Entomologist,	N. C. Coll. of A. & M. Arts, W. Raleigh, N. C.
IRBY, B., ...	Prof. of Agriculture, ...	N. C. Coll. of A. & M. Arts, W. Raleigh, N. C.
JAMES. C. C., ...	Deputy Minister of Agriculture.	Toronto, Ontario.
KOONS, B. F., Ph. D., ...	Prof. of Zoology and Geology,	Conn. Ag. Col., Storrs, Conn.
LATTA, W. C., ...	Prof. of Agri. and Supt. Farmers' Inst.,	Purdue Univ., Lafayette, Ind.
Mac KAY, A. H., ...	Supt. of Education, ...	Edu. Office, Halifax, N. S.
MASSEY, W. F., ...	Prof. of Horticulture, ...	Coll. of A. & M. Arts, W. Raleigh, N. C.
MELL, DR. P. H., ...	Direct. of Ala. Exp. Sta.,	Auburn, Alabama.
MERROW, H. L., ...	Botanist, ...	R. I. Coll. of A. & M. Arts, Kingston, R. I.
MILLER, MRS. M. R., ...	Inst. in Nature Study, ...	Cornell Univ., Ithaca, N. Y.
MILLS, JAMES Ph. D., ..	Pres. of Ontario College,.	Guelph, Ontario.
MUNSON, W. M., ...	Prof. of Horticulture., Me. Agri. Exp. Sta.,	Orono, Me.
MURKLAND, CHAS. S.,	Pres. N. H. Coll. of Agri.,	Durham, N. H.
NEWMAN, C. L., ...	Prof. of Agriculture, ...	Univ. of Ark., Fayetteville, Ark.
PRICE, P. H., ...	Prof. of Horticulture and Mycology,	A. & M. Coll., College Station, Texas.
RAYMOND, JEROME H. Ph. D.,	Pres. W. Virginia Univ....	Morgantown, W. Va.
RHODES, A., ...	Assist. Horticulturist, ...	N. C. Coll. of A. & M. Arts, W. Raleigh, N. C.
SAUNDERS, WM., ...	Direct. of Exp. Station, ..	Ottawa, Canada.
SILVESTER, R. W. Ph. D.,	Pres. of Md. Agri. College,	College Park, Md.
SMILEY, ELMER E., ...	Pres. and Director of Agri. Exp. Sta.	Univ. of Wyoming, Laramie, Wyoming.
STUBBS, W. C., ...	Direct. Exp. Sta., Audubon Park.	New Orleans, La.
SUGGS, D. C., ...	Vice Pres. and Direct. of Scientific Dept. of State Indus. Col.	College, Georgia.
TANNER, J. M., Ph. D., ..	Pres. of Agri. Coll. of Utah.	Logan, Utah.
THOMPSON, JOHN.	Head of Dept. of Agri. and Chem.	A. & M. College, Greensboro, N. C.
THORNE, CHAS. E., ...	Direct. Ohio Agri. Exp. Station.	Wooster, O.

List of Persons Recommending Books—*Continued.*

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VOORHEES, EDW. B., ..	Direct. of N. J. Agri. Exp. Sta. and Prof. of Agri., Rutgers College.	New Brunswick, N. J.
WALKER, ERNEST, ...	Ento. and Asst. Hort., ..	Clemson College, S. C.
WATSON, G. C., ...	Prof. of Agri., ...	State College, Centre Co., Pa.
WOODS, CHAS. D., ...	Direct. of Agri. Exp. Station.	Orono, Me.

Also thanks are due for valuable lists of books and other assistance to the following:

MISS BROOKS, Erie Public Library, Erie, Pa.
MRS. WALLACE DE WITT, Erie, Pa.
MISS HANNAH P. JAMES, Librarian, Osterhout Free Library, Wilkes-Barre, Pa.
MISS L. A. EASTMAN, Cleveland Public Library, Cleveland, Ohio.
MISS LOUISE MILLER, late Supervisor of Schools, Detroit, Mich.
M. W. PLUMMER, Librarian, Pratt Institute Free Library, Brooklyn, N. Y.
MRS. L. L. W. WILSON, Ph. D., Philadelphia Normal School.
MISS HOAGLAND, Principal of Grammar Grades, Willard School, Harrisburg.
MISS WILSON, Principal Verbeke School, Harrisburg.
MISS SAYFORD, late of Verbeke School, Harrisburg.
MISS ETHEL TORRINGTON, Harrisburg, Pa.
PROF. L. O. FOOSE, Superintendent of Schools, Harrisburg, Pa.

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	OUR NATIVE BIRDS, HOW TO PROTECT AND ATTRACT THEM. By D. Lange (new). Published by Macmillan & Co., New York, ...	75
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8.	CITIZEN BIRD. By Mabel Osgood Wright. Published by Macmillan & Co., N. Y.,	1 50
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	CHILDREN WITH THE FISHES. By Mrs. Maskell. Published by Little, Brown & Co., Boston,	1 00
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	LEAVES FROM NATURE'S STORY BOOK. By Mrs. Kelly. Published by Educational Publishing Company, Boston,	40
3.	THE HONEY MAKERS. By Margaret Morley. Published by McClurg & Co., Chicago.	1 50
Bull. 99.	THREE INSECT ENEMIES OF SHADE TREES. United States Department of Agriculture, Washington, D. C.,	Free.
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	MINERALS AND HOW TO STUDY THEM. By E. S. Dana. Published by D. Appleton & Co., N. Y.,	50
	STORY OF A PIECE OF COAL. By E. A. Martin. Published by D. Appleton & Co., N. Y.,	50
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2.	CORN PLANTS. By F. L. Sargent. Published by Houghton, Mfflin & Co., N. Y.,	75
	DIRECTIONS FOR COLLECTING AND PRESSING PLANTS, in Bailey's Lessons With Plants, Chapter 87, page 437-445.	
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4.	NATURE READER NO. 2. By Mrs. Wilson. Published by Macmillan & Co., N. Y.,	90
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5.	TREE CHARTS. By Grace Anna Lewis, Media, Pa. (each),	50
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5.	LIFE HISTORIES OF AMERICAN INSECTS. By Clarence M. Weed. Published by Macmillan & Co., N. Y.,	1 50
4.	MANUARL FOR TEACHERS OF NATURE STUDY IN ELEMENTARY SCHOOLS. By Mrs. Wilson. Published by Macmillan & Co., N. Y.,	90
	ORIGIN OF CULTIVATED PLANTS. By De Candolle. Published by D. Appleton & Co., N. Y.,	2 00
11.	PLANT RELATIONS. By J. M. Coulter. Published by D. Appleton & Co., N. Y.,	1 50
	PLANTS. By J. M. Coulter. (New edition of Plant Relations and Plant Structure.) Published by D. Appleton & Co., New York,	1 60
5.	WINNERS IN LIFE'S RACE. By Arabella Buckley. Published by D. Appleton & Co., N. Y.,	1 50

BOOKS OF REFERENCE.

6.	GRAY'S MANUAL OF BOTANY. Published by American Book Co., N. Y.,	2 00
	ILLUSTRATED FLORA OF N. AMERICA. 3 vols. Britton & Brown. Published by Charles Scribner's Sons, New York,	9 00

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4.	FIRST BOOK OF ZOOLOGY. By E. S. Morse. Published by D. Appleton & Co., New York,	75
5.	STORY OF ANIMAL LIFE. By J. A. Thompson. Published by Scribner's Sons, N. Y.,	1 40
13.	WILD ANIMALS I HAVE KNOWN. By Ernest S. Thompson. Published by Scribner's Sons, N. Y.,	2 00
3.	WILD NEIGHBORS. By Ernest Ingersoll. Published by Macmillan & Co., N. Y.,	1 50

BIRDS.

4.	BIRD CRAFT. By Mabel O. Wright. Published by Houghton, Mifflin & Co., N. Y.,	2 50
6.	BIRD LIFE (COLORED PLATES). By Frank M. Chapman. Published by D. Appleton & Co., N. Y.,	1 75 & 3 75
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3.	OUR COMMON BIRDS AND HOW TO KNOW THEM (CONVENIENT HANDBOOK). By Grant. Published by Scribner's Sons, N. Y.,	1 50
	OUR NATIVE BIRDS. By D. Lange. (New.) Published by Macmillan & Co., N. Y.,	75
	REPORTS ON ECONOMIC ORNITHOLOGY. Department of Agriculture, Washington, D. C.,	Free.
	SOME COMMON BIRDS IN THEIR RELATION TO AGRICULTURE (Bulletin 54), published by Department of Agriculture, Washington, D. C.,	Free.

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Bull.
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BIRDS, BEES AND SHARP EYES. By John Burroughs.
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THE FRIENDSHIP OF NATURE. By Mabel O. Wright.
Published by Macmillan & Co., N. Y., ... 1 75

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2.	FAMILIAR FLOWERS OF FIELD AND GARDEN. By Mathews. Published by D. Appleton & Co., N. Y.,	1 75
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	GUIDE TO THE TREES (COLORED PLATES). By Alice Lounsberry. Published by Fred'k Stokes & Co., N. Y.,	2 25
2.	HOW TO KNOW THE FERNS. By Mrs. Dana. Published by Scribner's Sons, N. Y.,	1 50
6.	HOW TO KNOW THE WILD FLOWERS. By Mrs. Dana. Published by Scribner's Sons, N. Y.,	1 75
1.	LEGUMINOUS PLANTS. By E. W. Hilgard. Published by Macmillan & Co., N. Y.,	1 00
	LIVING PLANTS AND THEIR PROPERTIES (new). By Arthur MacDougal. Published by D. T. MacDougal, Bedford Park, New York,	1 25
1.	ORIGIN OF CULTIVATED PLANTS. By De Candolle. Published by D. Appleton & Co., N. Y.,	2 00
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11.	PLANT RELATIONS. By J. M. Coulter. Published by D. Appleton & Co., N. Y.,	1 50
6.	THE SPRAYING OF PLANTS. By E. G. Lodeman. Published by Macmillan Co., New York,	1 00
	WEEDS: AND HOW TO KILL THEM. United States Department of Agriculture, Washington, D. C. (Bulletin 28),	Free.
	SOIL.	
8.	FERTILITY OF THE LAND. By I. P. Roberts. Published by Macmillan & Co., N. Y.,	1 25
17.	THE SOIL. By F. H. King. Published by Macmillan & Co., N. Y.,	75
4.	VEGETABLE MOULD AND EARTHWORMS. By Chas. Darwin. Published by D. Appleton & Co., N. Y.,	10 & 1 50
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	BIRD LORE. Published by Macmillan & Co., N. Y. per year),	1 00
	ST. NICHOLAS (DEPT. OF NATURE AND SCIENCE FOR YOUNG FOLKS). Published by the Century Co., N. Y.,	3 00

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1.	CHEMISTRY OF SOILS AND FERTILIZERS. By H. Snyder. Published by Chemical Publishing Company, Easton, Pa., ...	1 50
11.	FIRST PRINCIPLES OF AGRICULTURE. By E. B. Voorhees. Published by Silver Burdett Co., Boston, ...	1 00
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6.	HOW CROPS GROW. By S. W. Johnson. Published by Orange Judd Company, N. Y., ...	2 00
2.	MILK AND ITS PRODUCTS. By H. H. Wing. Published by Macmillan & Co., New York, ...	1 00
1.	PRINCIPLES OF AGRICULTURE. By I. O. Winslow. Published by American Book Company, N. Y., ...	60
13.	PRINCIPLES OF PLANT CULTURE. By E. S. Goff. Published by E. S. Goff, Madison, Wis., ...	1 10
1.	PRINCIPLES OF VEGETABLE GARDENING. By L. H. Bailey. Published by Macmillan & Co., N. Y., ...	1 25
3.	PUBLIC SCHOOL AGRICULTURE. By Mills & Shaw. Published by Bryant & Co., Toronto, Canada, ...	40

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	ASTRONOMY. By Julia McN. Wright. Published by Penn Publishing Company, Philadelphia, ...	38
3.	STORY OF THE SOLAR SYSTEM. By G. F. Chambers. Published by D. Appleton & Co., N. Y., ...	30

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	PHYSICAL GEOGRAPHY AND GEOLOGY.	
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	BOTANY. By L. H. Bailey (new). Published by Macmillan & Co., New York,	1 10
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	SURVIVAL OF THE UNLIKE. By L. H. Bailey. Published by Macmillan & Co., New York,	2 00
	STORY OF THE COTTON PLANT. By F. Wilkinson. Published by D. Appleton & Co., New York,	50
	THE EVOLUTION OF OUR NATIVE FRUITS. By L. H. Bailey. Published by Macmillan & Co., New York,	2 00
5.	TALKS AFIELD. By L. H. Bailey. Published by Macmillan & Co., New York,	1 00
	THE FARMSTEAD. By I. P. Roberts (new). Published by Macmillan & Co., New York,	1 25
	THE NATURAL HISTORY OF PLANTS. 4 vols. By Kerner and Oliver. Published by Blackie & Son, London,	15 00

AN ACT

Authorizing levy of tax for establishing libraries.

Section 1. Be it enacted, etc., That for the purpose of securing a system of free, non-sectarian, public libraries on a substantial and permanent basis throughout the Commonwealth, authority is hereby given to the board of school directors, or to any board or organization having control of the common schools, in each and every common school district, except in cities of the first and second class, whenever the same may be decided upon by a majority vote of all the members thereof, to provide a place for and establish and maintain such public library for the general use of the residents in the district, subject to the ensuing provisions of this act.

Section 2. Said board may set aside the whole or a portion of any school house, now or hereafter erected, within the district for the uses and purposes of such library, having due regard to the convenience of the citizens, and may make any changes, repairs or additions that may be necessary to properly carry out the objects of this act, or, at its option, may lease, purchase or erect a suitable building in some convenient location for the use, storage and accommodation of such library, but no land or structure shall be purchased or building commenced until the cost thereof has been fully provided for under the laws regulating the erection of new school houses within the district.

Section 3. It shall be lawful for said board to levy a tax for the purchase, improvement and maintenance of said library not exceeding one mill in any one year on the valuation of the property assessed for school purposes in the district, which tax shall be collectible as the school taxes of the district are at the time of collecting the same.

Section 4. The public library of each district shall be under the general management of nine trustees acting as the agents and appointees of the school board, who shall approve all plans for its storage and accommodation, purchase and take charge of all books, maps, documents, relics and literary, historical or other contributions, appoint all employes and make all regulations and do all things necessary to its government, preservation and maintenance, subject to the approval of the board. The president and treasurer of the board

and the superintendent of the schools of the district (or if there is no such officer the secretary of the board) shall be ex-officio members of the board of trustees. The other six members shall be elected by the school board, two each for one, two and three years, and annually thereafter two members shall be chosen by said board for the term of three years. Each trustee shall serve until his successor is elected, and in case of a vacancy it shall be filled by the school board for the unexpired term. The trustees shall make a report to the school board once each year, and oftener if called upon, of such subjects and in such manner as may be required by said board.

Section 5. All public libraries established as above shall be under the general supervision and subject to the inspection of the State Librarian, who is hereby empowered to require thereof to be made by the trustees at such time and in such manner as he may see proper.

Section 6. It shall be lawful for the school board of any common school district, and their successors in office, to receive and hold, free from all collateral inheritance tax, any devise, bequest, grant, endowment, gift, donation or contribution of property real, personal or mixed which shall be made for the establishment, improvement or maintenance of a public library as herein provided for, and the same to apply to the purpose for which made or given, and said board, or their successors in office, are hereby authorized to bring suit and do all necessary acts for the recovery, holding, use and application thereof: Provided, That this act shall not apply to cities of the first class: Provided further, That in cities which have established a board of trustees for the management of a free library established by said municipality, any land or buildings appropriated to free library purposes under the operation of this bill, shall be under the control of said board of trustees.

Section 7. All laws or parts of laws inconsistent herewith are repealed.

Approved—The 28th day of June, A. D. 1895.

DANIEL H. HASTINGS.

No. 9.

A SUPPLEMENT.

Section 1. Be it enacted, etc., That in any school district, except cities of the first and second class, wherein there is or shall hereafter be established, otherwise than under the provisions of the act to which this is a supplement, a free non-sectarian public library, the school directors, board of organization having control of the common schools of said district may, instead of establishing another public library and providing for its government, extend aid to such library on such terms as to control and management as shall be agreed upon between the managers thereof and the school authorities, and for that purpose may levy taxes provided for in the act to which this is a supplement in the manner provided therein.

Section 2. The managers of any public library receiving aid under this act shall annually report to the school board furnishing such aid an account of the expenditure of the money so received, under the oath of the managers or their secretary and treasurer, and such account shall be subject to the jurisdiction of the auditors by whom the accounts of the school board are audited in like manner as their accounts.

Approved—The 30th day of March, A. D. 1897.

DANIEL H. HASTINGS.